Visionary Cataract and Refractive Techniques: Explore With Us

Who is really at the leading edge of refractive and cataract surgery? Bausch + Lomb puts forward its case.

Contributors

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Latest Technology and Experience with the TECHNOLAS® TENO™ 317 Model 2

Dr Tobias Neuhann, Germany
Therapeutic Indications and Latest Technology on the VICTUS® Femtosecond Laser Platform

Dr Thomas Poole, UK
The VICTUS® Femtosecond Laser Platform in a Public Hospital Setting

Dr Luis Cadarso, Spain
Clinical Experience with enVista®

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Legal Manufacturer of the VICTUS Femtosecond Laser Platform and the TECHNOLAS TENO 317 Model 2: Technolas Perfect Vision GmbH, Messerschmittstr. 1+3, 80992 München, Germany.
In a technology-led industry like eyecare, almost everyone is shouting that their products are the latest and greatest in the market; the biggest and best. To be fair, there’s a lot of advanced technology to shout about in cataract, refractive and corneal surgery, including femtosecond and excimer lasers and advanced IOL materials and designs. Who really is at the leading edge of ophthalmic innovation in the anterior segment and what else is on the horizon? Surgeons Sheraz Daya, Tobias Neumann, Thomas Poole and Luis Cardarso share their experiences with Bausch + Lomb’s advanced laser and IOL offerings.

SHERAZ DAYA, Medical Director, Centre for Sight, East Grinstead, Sussex UK

I’ve been a happy user of the Technolas TENEO 317 Model 1 excimer laser for over three years now… but I recently moved to the Model 2. So what’s changed? Are patients experiencing better outcomes? Was the upgrade worth it? Let’s take a look. The short answer is, unsurprisingly, yes, and there are a number of features that come together that are helping drive better outcomes and speedier and more efficient procedures (Box 1). Let’s start with how easy it is to use like my Tesla Model 3, almost everything is presented and controlled from a large, 24” touchscreen, with a simple, clear and functional graphical user interface. Everything from magnification changer control settings to energy check counters are there, and again, like my Tesla, the performance is stable and easy to position too. Everything is presented and controlled from the touchscreen. It makes little sense to accomplish what they need to achieve in the simplest manner possible.

Swifter! With the Model 2, you get what’s expected, better outcomes and speedier procedures. The laser technology manages to achieve the sweet-spot of 200 mJ/cm² (2), a pulse distribution algorithm that employs optimised entropy (i.e. disordered) laser pulse sorting, and a dynamic rotation tracking and pupil shift compensation. Importantly, the system features a digital coaxial camera. Older systems had a problem: if the patient’s eye moved in the Z-axis, it could result in a slight decentration. The coaxial camera is used to eliminate that possibility. But the fast-tracking speed is matched with fast lasers, and this allows fast and efficient surgery. A 6.00 D, using a standard treatment takes only around 1.0 second per diopter (1) – in other words, 6 seconds from start to finish; an astigmatic eye of -4.00, -2.00 requires only 6.00 seconds too. Less demanding cases are done in 3–5 seconds, and this speed can be tremendously useful if you deal with high patient volumes.

The laser technology manages to achieve this by using an optimal system; an energy delivery at the sweet-spot of 200 mJ/cm² (2), a pulse distribution algorithm that employs optimised entropy (i.e. disordered) laser pulse sorting, and a single-nozzle design for plume evacuation, which I can assure you is patient-friendly and surgeon-friendly; it doesn’t get in the way during surgery.

Figure 1. Preoperative BCVA and postoperative UCDVA – PROSCAN (62 eyes)

Figure 1. Preoperative BCVA and postoperative UCDVA – PROSCAN (62 eyes treated with PROSCAN, on the TENEO 317 Model 2).

Inclusion criteria: Pre-op BCVA 20/25 or better, Pre-op Refraction: Sphere up to -7.5 D and cyl. up to -5.25 D, Treatment target was intended value (in spherical equivalent). Exclusion criteria: one case with post-op striae as a flap complication has not been considered; treatments targeting for monovision have been excluded. Data courtesy of J. Castanera, S. Daya, P. Levy and F. Nouira.

Road test results
But the real work happens in the Tesla where the rubber hits the road. And the true test of the TENEO 317 Model 2 is patients’ outcomes – and data on the first LASIK outcomes with the Model 2 are now available. Records came from four sites: ours, the Centre for Sight in East Grinstead (UK)*, the Clinique de la vision in Montpellier, France*; the Centre Ophtalmologique de Laser Excimer en Tunisie in Sousse, Tunisia*; and the Instituto Castañera Oftalmología in Barcelona, Spain*, where the lead surgeons were myself, Pierre Levy, Fethi Nouira and Jorge Castanera, respectively. This was a real-life, retrospective analysis, not an investigative study. All patients received LASIK, and were given either PROSCAN® (n=62) or Zyoptix HD® (wavelfront aspheric, n=64) treatments; assessments were made pre-operatively and at 1 day, 1 week, and 1 month post-operatively. In the Zyoptix HD group, 95 percent of eyes achieved 20/20 UCDVA versus pre-op BCVA of 94 percent, showing good efficacy of the procedure; similarly, 100 percent of eyes were within 0.5 D of the intended value (in spherical equivalent), indicating its good predictability. In the Proscan group, 100 percent of eyes achieved 20/20 UCDVA (Figure 1) and 100 percent of eyes within 1.0 D and 97 percent were within 0.5 D of the intended value (in spherical equivalent).

Table 1. Preoperative BCVA and postoperative BCVA – TENEO Model 2

<table>
<thead>
<tr>
<th>Pre-op BCVA</th>
<th>Post-op BCVA (20/20)</th>
<th>Post-op BCVA (20/25)</th>
</tr>
</thead>
<tbody>
<tr>
<td>20/12.5</td>
<td>20/12.5</td>
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Table 1. Preoperative BCVA and postoperative BCVA – TENEO Model 2.

Ticking the options list
Again, like my Tesla, the performance is swift! With the Model 2, you get what’s expected, better outcomes and speedier procedures. The surgeon’s own preferences. The TENO 317 Model 2 has a built-in video camera; unlike my Tesla (which has many cameras, but came with no Dashcam feature!), the Model 2 has a large, 24” touchscreen, with a simple, clear and functional graphical user interface. Everything from magnification changer control settings to energy check counters are there, and again, like my Tesla, the performance is stable and easy to position too. Everything is presented and controlled from the touchscreen. It makes little sense to accomplish what they need to achieve in the simplest manner possible.

Simpler is better
The new microscope (sourced from Zeiss) integrates well with the touchscreen to control the bed, and the new bed is

Figure 2. Key features of the TENEO Model 2.

Figure 2. Key features of the TENEO Model 2.

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This model does more. So what have I gained by upgrading from the Model 1 to the Model 2? The Model 2 does everything the Model 1 can do, but far faster; with greater ease, and, I believe, with a potentially higher level of accuracy. But there is more to come in our current work is examining the feasibility of using the Model 2 for transepithelial PRK and topography-guided LASIK.

Why use it for transepithelial PRK? Because it turns the procedure into an all-laser ablation – you don’t touch the cornea. Because it turns the procedure into an all-laser ablation – you don’t touch the cornea. Laser ablation – you don’t touch the cornea. No-touch laser” approach. This “no-touch laser” approach. This “no-touch laser” approach. Laser ablation – you don’t touch the cornea. And we’re really looking forward to putting alcohol in the eye for 30 seconds alone, never mind the time to scrape the epithelium and then allow the surface to dry before laser ablation! When performing PRK, the actual treatment requires only 2 seconds for a refraction of +1.00 and -1.50 astigmatism. Not only is the Transepithelial PRK very rapid, but subsequent healing is potentially too. Visual outcomes appear to be excellent – a contact lens is placed after the procedure, epithelialization typically completes within three days. In essence, the Transepithelial PRK from a two-step treatment to a one-step treatment process.

What is the rationale for topography-guided LASIK or PRK? Simply put, it’s likely to further improve refractive outcomes in hyperopes, those with high astigmatism and other instances such as decentered pupils where the visual axis is not aligned with the center of the pupil. In addition, topography-based guidance should help correct coma, irregular astigmatism, decenteration and poor distance visual acuity resulting from previous ablations to an even greater standard than before, and in the right cases, can be used in patients with forme fruste keratokeratosis for the treatment of photopic symptoms such as glare, halo and distortion.

Conclusion

The Teneo 317 Model 2 is fast and responsive, intuitive to use, and in my opinion, the initial results have provided good outcomes. There’s more to come, and we’re really looking forward to innovations and features like transepithelial PRK and topo-guided treatments coming to the market. Much like my Tesla, the Model 2 has significantly improved our efficiency and speed, and it is a delight to have!

References

1. Based upon a standard myopic treatment and 6 mm optical zone

Therapeutic Indications and Latest Technology on the VICTUS® Femtosecond Laser Platform

TOBIAS NEUHANN, Medical Director, AaI Augenklinik Marienplatz Munich, Germany

Femtosecond lasers for cataract surgery have been on the market for over five years now, but the questions for me are: has the technology advanced over this period, and if so, what advances have been made? I have been using the latest B&L VICTUS femtosecond laser platform for over a year now, and I can tell you that it has a number of key features that are really improving my patients’ outcomes. The feature list is long, and I appreciate the VICTUS’ ability to create LASIK flaps and perform different kinds of keratoplasty, but in terms of cataract surgery, there are three key ones that I want to focus on as they are the most important in terms of improving patient outcomes.

The OCT is central to centration on the visual axis.

The first is the latest Swept Source OCT system (Figure 1). It has a very high resolution, it displays a live OCT image throughout the procedure and performs 50,000 A-scans per second – I view it as almost having a “mic” quality! The system also has enhanced contrast sensitivity compared with previous instruments; and the new software offers the automatic recognition of the pupil, lens thickness and the anterior and posterior capsule. See the OCT in action online as part of femtosecond laser-assisted cataract surgery at: https://youtu.be/-6VkDF0G7gQ

Figure 1. The new Swept Source OCT system: 50,000 A-scans per second enhanced contrast sensitivity, plus automatic recognition of the pupil, lens thickness and the anterior and posterior capsule. See the OCT in action online as part of femtosecond laser-assisted cataract surgery at: youtu.be/-6VkDF0G7gQ

Figure 2. a) The optical axis of the eye (a purely theoretical construct where the surfaces of the cornea and crystalline lens are rotationally symmetric and their centers of curvature lie on a common line), if a point source was shone into the eye, there would be a point where all the Purkinje images coincide – the line from the point source through each Purkinje image would define the optical axis. In real eyes, the Purkinje images do not align and the surfaces are not rotationally symmetric; so no true optical axis of the eye exists. Occasionally, the optical axis is defined as the line that minimizes the deviation of the Purkinje images to the fovea, the center of the pupil, E, and the nodal points N and N’. b) The optical axis is defined as the line that minimizes the deviation of the Purkinje images to the fovea, the center of the pupil, E, and the nodal points N and N’. c) coaxially sighted corneal light reflex (CCLR), where the line from the fixation point is normal to the cornea defines the CCLR; d) The visual axis (perpendicular to the cornea, found by aligning the first Purkinje image with the center of the pupil) and the line of sight (connecting the fixation point to the center of the entrance pupil).

Conclusion

Of which can be seen in a surgical video of mine, available here: https://youtu.be/-6VkDF0G7gQ

With all of the axes in the eye (Figure 2), it can be hard to decide how to center your laser capsulotomies (or even more so, manual capsulorhexes). I strongly believe that it’s best to center the capsulotomy on

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Sponsored Feature
The optics of IOLs are becoming increasingly sophisticated, and apex centration should now be considered a mandatory tool for sophisticated IOLs such as aspheric monofocal, multifocal or trifocal toric IOLs. The latest VICTUS system’s high-resolution OCT is definitely superior to a Purkinje image and will be the "conditio sine qua non" for the next generation of IOLs.

It will enable more patients to benefit from the advantages of these IOLs, should help avoid the specter of negative dysphotopsia (especially the outer dark arc which patients often complain about and for which there is no real solution), and events like capsular phimosis and post-operative toric IOL rotation. When you look at some of the most recent IOLs to come to the market with a groove in the optic edge, that “hooks” the lens in place at the anterior capsule; you start to see the benefits of the femtosecond-laser rhexis approach: when you implant this lens in a standard eye, via an apex-centered capsulotomy, phimosis can’t occur, because the anterior capsule sits inside the lens, and the lens cannot rotate. Fixating the IOL on the anterior capsule means it is closer to the iris and hence will not create any negative dysphotopsia.

The visual axis, and the OCT supports this by calculating 0° and 90° on the surfaces of the anterior and posterior capsules. Where the lines cross (Figure 3), you center the capsulotomy – which enables you to find the apex of the lens. Without this, most of us would center the capsulotomy on the pupil center (which is easiest) – but there is a noticeable difference in positioning (Figure 4). But, in my experience, the result of using the VICTUS OCT-guided method is that the center of the lens is optimally positioned in the capsular bag, centered on the visual axis. This is particularly important for aspheric, toric and multifocal lenses, and it’s now easy to do something that was previously very difficult – and it’s all thanks to the VICTUS apex centration capability.

One of the best features of using the VICTUS for DALK is the entirely atraumatic nature of incising the donor cornea: you don’t press the trephine against the cornea; you just dock the donor cornea and divide the corneal tissue with the laser. It’s not only gentle, but very fast too – at least as fast as performing a manual trephination – and it results in a perfect edge in the donor button.

It’s then a case of proceeding with the DALK as normal: putting the donor button in medium, creating a big bubble in the patient’s eye with a 30 G needle, and cutting a flap in the deep stroma without damaging the Descemet’s membrane, then you’re at the stage where you insert the donor into the recipient eye. To finish, you simply stitch the donor transplant in place.

But is the future of DALK no longer a circular transplant, but a decagonal one? Back in the 1960s, Barraquer tried transplants with four edges, so there is a precedent: he figured that the edges would stop the donor from rotating (as can be the case with circular transplants). It’s only really now, with femtosecond lasers, that we can construct a decagonal transplant with an outstanding fit to the patient. Hopefully, the software that permits this will be broadly available soon.

The optics of IOLs are becoming increasingly sophisticated, and apex centration should now be considered a mandatory tool for sophisticated IOLs such as aspheric monofocal, multifocal or trifocal toric IOLs. The latest VICTUS system’s high-resolution OCT is definitely superior to a Purkinje image and will be the "conditio sine qua non" for the next generation of IOLs. It will enable more patients to benefit from the advantages of these IOLs, should help avoid the specter of negative dysphotopsia (especially the outer dark arc which patients often complain about and for which there is no real solution), and events like capsular phimosis and post-operative toric IOL rotation. When you look at some of the most recent IOLs to come to the market with a groove in the optic edge, that “hooks” the lens in place at the anterior capsule; you start to see the benefits of the femtosecond-laser rhexis approach: when you implant this lens in a standard eye, via an apex-centered capsulotomy, phimosis can’t occur, because the anterior capsule sits inside the lens, and the lens cannot rotate. Fixating the IOL on the anterior capsule means it is closer to the iris and hence will not create any negative dysphotopsia. I have no doubt that this will be the next generation of IOL optics.
Making it work: theory
Our predictions suggested that having access to two operating theatres was a cost-effective purchase – our projections indicated that a femtosecond pathway would allow two extra patients on each cataract list.

“...cost benefits of the laser, we planned to move to cataract-only operating lists – local anesthetic only, avoiding complicated cases such as uveitis or traumatic cataract, and avoiding small pupils and toric lenses where possible. There was another key consideration: avoiding patients require a long time to be hoisted onto the operating table – for example, the very frail. So by eschewing cases which would slow us down, streamlining our processes – and, importantly, by retaining adequate theatre staffing levels, we thought we would maintain high operating throughput and see laser-associated cost efficiencies, and outcomes.

As always, there are real-world practical issues to contend with: getting somewhere to install the VICTUS required the cataract service to reclaim an injection room from the medical retina service – a rare victory! In terms of the day-to-day practicalities, I was initially concerned that our more elderly patients might not actually get under the laser; as the bed doesn’t have the same degree of movement as an ordinary operating table – but in fact that kind of problem is very rare, as the VICTUS table head is actually quite flexible.

We also found that timing is very important: for example, Mydriasis requires 45 minutes to take effect, so we need to bring in our patients a little bit earlier. We also need the laser properly calibrated for a flying start at 8 am in the morning – that really helps. Our femtosecond laser with the latest software and setup has also contributed to overall efficiency: if you achieve a really good docking on the femto, you get a virtually perfect capsulotomy, and that gives you greater confidence because you know you are not going to get a tag. The latest laser setup also has improved the frag step: nuclear segments cleave more easily during phacoemulsification. Another pertinent development has been our adoption, this year, of the EyeCee One lens. By using this preloaded device, we save further time, as you don’t need to spend an additional minute or so to load a lens into the injector: over ten patients, this saves you the time for a coffee break!

Making it work… in practice
So how have these changes affected our operational throughput? The results are very clear: 2,283 cataract operations in the year preceding laser adoption vs. 3,037 in the following year (Box 1). This represents an extra 754 cases, which was a 25% increase in capacity. Of the 3,037 operations carried out in the year after laser purchase, 294% were carried out with the laser; I’d hoped for a higher percentage, but it’s inevitable that some surgeons will prefer to do things as they did before, and that some patients will not meet the criteria for the FLACS list. I expect a higher proportion of laser surgeries next year.

On a day-to-day basis, throughput improvements depend on what trainee I have with me. If I have a very junior trainee, a pre-laser list of 6 cataracts might get bumped up to 8 with the laser; with a more senior trainee with me, a pre-laser list of 8 might get pushed up to 10. In all cases, the patient flow is critical: we achieve our best efficiencies by having three surgeons operating at the same time – one surgeon in each operating theater, and one surgeon in the laser room feeding his two colleagues. Our experience is that the femtosecond surgeon easily keeps ahead of the two phaco surgeons. The bottom line is after all of this planning, we have a fast and efficient process: from the treatment time with the laser, to the phaco, to the lens insertion.

Special cases
The VICTUS isn’t just limited to standard cataract cases. Arcuate incisions are very easy to do with the VICTUS – with live OCT you can adjust the arcuate incision depth for the optimal outcome. It only adds another two minutes to the laser room cataract surgery. And the beauty of VICTUS is that you can use it in cases of very low delta k; so if somebody has an ‘against the rule’ of 0.75 D, I may do a couple of little arcuate incisions to get their cylinder down. But similarly, a 90-year-old patient who wishes to wear glasses post-operatively, and who has a high cylinder – maybe 3 to 3.5 D – can also be treated with the laser to reduce that cylinder to 1 D. So the VICTUS gives us another option – we don’t necessarily need to insert a toric lens. Indeed, while we perform arcuate incisions in 21 percent of FLACS operations, in the year before VICTUS we used 133 toric lenses – but only 75% the year after VICTUS. This 44 percent reduction in toric lens use provides not only a small saving in costs, but also savings in theater time and surgeons’ administrative time for toric lens ordering.

Finally, we’ve also been using the VICTUS for corneal surgery – it’s very versatile! I used to cut my corneal ring inserts by hand, but now I do them with a femtosecond laser, which is a heck of a lot easier. We can also be doing penetrating and deep lamellar grafts, which has been great fun.

In summary, the VICTUS has enabled significant efficiency improvements in my NHS ophthalmology unit: it has been the catalyst which enabled us to achieve more productive and cost-effective surgical procedures and theater processes. When used correctly with a team of surgeons, FLACS is fast, accurate, and efficient.
Clinical Experience with enVista®

LUIS CADARSO, Medical Director at the Clínica Cadarso, Vigo, Spain

When you’re choosing IOLs to offer your patient, there are a number of fundamental aspects you need to consider before making that decision: an excellent biomaterial, high-quality optics, and, crucially, in the case of astigmatic patients, excellent rotational stability of the lens. I regularly offer the enVista IOL to my patients – so let’s consider whether enVista fulfills these needs or not.

enVista lenses are made from cross-linked homogenous, hydrophobic acrylic material, with excellent dimensional and thermal stability. It has a high refractive index—which is important (especially in toric versions) as it makes the lens very thin—although it also has a high modulus, meaning that the lens maintains its mechanical properties, despite its subtle dimensions. It has durable optical surfaces, which both resist both scratches during implantation, and Nd:YAG laser damage (1). It comes supplied pre-hydrated in 0.9% saline to equilibrium, and therefore has optimized water content. But most importantly for me, the material has been shown over a number of years now to be stable and glistening-free—indeed, it has been shown to be stable and glistening-free, which is important (especially in toric versions). We all know postoperative rotational stability is crucial for maintaining the performance of toric IOLs (e.g., 10° off axis will reduce correction by 30%); 30° off axis abolishes any astigmatism correction; 90° off axis doubles astigmatism. enVista’s FDA submission clinical study shows that the lens is rotationally stable—in the best-case analysis set, 92 percent of eyes exhibited 5° or less of rotation between operative day and the 6-month post-operative visit.

The haptic design brings another advantage: the small anterior offset relative to the optic (~0.2 mm), that has been designed to vault the optic posteriorly for direct contact with the capsular bag, along the sharp-edged (R = 10 μm) 360° posterior square edge (Figure 1), helping the lens guard against PCO—indeed, one study showed that the incidence of Nd:YAG capsulotomy rates over 3 years was only 2.2 percent (5/126 eyes) (4).

As a cataract surgeon, you’ll know that some IOLs are easier to inject and handle than others—I found that injecting and implanting the lens is easy: unfolding it makes the lens very thin—a sharp edge radius (R ~ 10 μm), an anterior offset of haptics relative to the optic, designed to vault the optic posteriorly for direct contact with the capsular bag. Images courtesy of David Spalton.

Table 1. Pre-operative refractive patient/eye characteristics (52 eyes, 41 patients).

<table>
<thead>
<tr>
<th>Measurement</th>
<th>Value</th>
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<tr>
<td>IOL spherical equivalent power</td>
<td>15.5 to 23.0 D</td>
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<tr>
<td>IOL cylinder power</td>
<td>1.25 D (n=28), 2.00 D (n=11), 2.75 D (n=13)</td>
</tr>
<tr>
<td>Gender</td>
<td>Male 72%, Female 28%</td>
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<tr>
<td>Incision size</td>
<td>2.3 to 3.0 mm</td>
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<tr>
<td>Incision on steep axis</td>
<td>46.8%</td>
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<td>Preoperative corneal astigmatism</td>
<td>0.37 D (0.61)</td>
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<tr>
<td>Range: 2.95 D</td>
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<tr>
<td>Expected postoperative residual cylinder</td>
<td>0.30 D (0.16)</td>
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<tr>
<td>Range: 0.68 to 2.95 D</td>
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Data on file, B+L Study #792_2012.

Table 2. Uncorrected distance visual acuities (UDVAs) at 3–6 weeks postoperatively.

<table>
<thead>
<tr>
<th>UDVAs</th>
<th>Value</th>
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<tr>
<td>20/25 or better</td>
<td>71.4%</td>
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<tr>
<td>20/30 or better</td>
<td>78.7%</td>
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<tr>
<td>20/40 or better</td>
<td>87.2%</td>
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Data on file, B+L Study #792_2012.

Table 3. Final manifest refraction spherical equivalent (MRSE) predictability at 3–6 weeks postoperatively.

<table>
<thead>
<tr>
<th>MRSE</th>
<th>Value</th>
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<tr>
<td>±0.50 D</td>
<td>75.0%</td>
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<tr>
<td>±1.00 D</td>
<td>95.3%</td>
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Data on file, B+L Study #792_2012.

Table 4. Effectiveness of the intervention – proximity to targeted refraction and cylinder.

<table>
<thead>
<tr>
<th>Residual manifest refraction cylinder</th>
<th>Value</th>
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<tr>
<td>% within I.O.D. of the target</td>
<td>93.2%</td>
</tr>
<tr>
<td>Mean reduction in cylinder in percentage</td>
<td>75.2%</td>
</tr>
</tbody>
</table>

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Box 1. enVista toric registry study design.

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- and improve intraoperative handling (especially for the toric versions). We all know postoperative rotational stability is crucial for maintaining the performance of toric IOLs (e.g., 10° off axis will reduce correction by 30%); 30° off axis abolishes any astigmatism correction; 90° off axis doubles astigmatism. enVista’s FDA submission clinical study shows that the lens is rotationally stable—in the best-case analysis set, 92 percent of eyes exhibited 5° or less of rotation between operative day and the 6-month post-operative visit.

Box 2. A comparison of toric IOL rotation 1 hour after surgery (6). Negative values indicate anti-clockwise rotation and positive values indicate clockwise rotation.

Box 3. enVista toric lens specifications. Note the modified C-Close haptic design that increases contact with the capsular bag and minimizes rotation and the 360° posterior square edge that minimizes PCO formation.

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Five EU sites were involved, from Spain, Germany, the Netherlands, Slovenia and Italy; 77 patients were screened, 56 eyes (from 44 patients) implanted; 52 eyes from 41 patients were included in the analysis. Four eyes were excluded from the analysis: one eye, because of a secondary glaucoma surgery, one eye with lens haptic damage during the injection procedure, and two eyes because of clinically significant retinal disease (CDVA less than 20/32) (Box 1).

Tables 1–4 show what we found. These are good results (5) – and they’re supported and reinforced by the work of Garzón et al., (6) who found that 90.5 percent of patients implanted with enVista toric after 30 days were within less than 5° of rotation (Figure 2). Packer et al. found that 92 percent of eyes exhibited 5° or less of rotation between implantation and 4-6 months later (7). My personal outcomes are similar – at 3 months, 88 percent of patients were within ± 0.5 D, and 91 percent of patients within less than 5° of rotation.

So what have we learned? The enVista is a high-quality aspheric toric IOL, made from glistening-free hydrophobic acrylic material. It is easy to implant through a 2.2 mm incision and has a high safety (3,7) and effectiveness profile, plus excellent stability with regards to rotation centration and tilt thanks to its advanced haptic and optic design. What’s most interesting about this lens, though, is that it was launched seven years ago; it was the first glistening-free IOL to the market, and there’s now a wealth of clinical experience to back up this claim. It’s a testament to the engineers that their innovative designs and material have stood the test of time.

References
4. T Tran, “Incidence of Nd:YAG capsulotomy of a hydrophobic glistening-free intraocular lens (MX60)”. Poster presented at the XXXIII Congress of the European Society of Cataract and Refractive Surgeons – ESCRS, September 2015, Barcelona, Spain.
5. Data on file, Bausch + Lomb, #792 CSR.